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IS 13937 (Part 2) : 1994
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मशीनरी और उपस्कर के व्यक्त शोर उत्सर्जन मानों को ज्ञात करने और प्रमाणन करने की सांख्यिकीय पद्धतियाँ

भाग 2 वैयक्तिक मशीनों के व्यक्त मानों की सामान्य (संक्रमण) पद्धति

Indian Standard

STATISTICAL METHODS OF DETERMINING AND VERIFYING STATED NOISE EMISSION VALUES OF MACHINERY AND EQUIPMENT

PART 2 METHODS FOR STATED VALUES FOR INDIVIDUAL MACHINES

UDC 534·835·46 : 519·23

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

March 1994

Price Group 1

Acoustics Sectional Committee, LTD 5

NATIONAL FOREWORD

This Indian Standard (Part 2) which is identical with ISO 7574/2 : 1985 'Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment Part 2 'Methods for stated values for individual machines' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Acoustics Sectional Committee (LTD 5) and approval of the Electronics and Telecommunication Division Council (LTDC).

The text of ISO Standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

CROSS REFERENCES

In this Indian Standard, the following International Standards are referred to. Read in their respective place the following:

International Standard	*Indian Standard*	*Degree of Correspondence*
IEC 651 : 1979 Sound level meter	IS 9779 : 1981 Specification for sound level meter	Technically equivalent
ISO 7574/1 : 1985 Acoustics —Statistical methods for determining and verifying stated noise emission values of machinery and equipment Part 1 General considerations and definitions	IS 13937 (Part 1) : 1993 Statistical methods for determining and verifying stated noise emission values of machinery and equipment : Part 1 General considerations and definitions	Identical
ISO 7574/4 : 1985 Acoustics—Statistical methods for determining and verifying stated noise emission values of machinery and equipment Part 4 Method for stated values for batches of machines	IS 13937 (Part 4) : 1993 Statistical methods for determining and verifying stated noise emission values of machinery and equipment : Part 4 Methods for stated values for batches of machines	Identical

The Technical Committee responsible for the preparation of this standard has reviewed the provisions of the following International Publications and has decided that they are acceptable for use in conjunction with this standard:

ISO 3741 Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms

ISO 3742 Acoustics — Determination of sound power levels of noise sources — Precision methods for discrete-frequency and narrow-band sources in reverberation rooms

ISO 3743 Acoustics — Determination of sound power levels of noise sources — Engineering methods for special reverberation test rooms

ISO 3744 Acoustics — Determination of sound power levels of noise sources — Engineering methods for free-field conditions over a reflecting plane

ISO 3745 Acoustics — Determination of sound power levels of noise sources — Precision methods for anechoic and semi-anechoic rooms

ISO 3746 Acoustics — Determination of sound power levels of noise sources — Survey method

ISO 4871 Acoustics — Noise labelling of machinery and equipment.

Indian Standard

STATISTICAL METHODS OF DETERMINING AND VERIFYING STATED NOISE EMISSION VALUES OF MACHINERY AND EQUIPMENT

PART 2 METHODS FOR STATED VALUES FOR INDIVIDUAL MACHINES

0 Introduction

A general introduction to the four-part series of ISO 7574 is given in ISO 7574/1.

For the purposes of this part of ISO 7574, the term "labelled value" stands for all kinds of stated values (e.g. information on a label, the upper noise limit set by an authority, the agreed contract value) for which the methods may be applied.

The methods described in this part of ISO 7574 are of a statistical nature only a restricted sense. Statistical view-points are relevant mainly when estimating the value of K (see clause **5**).

1 Scope and field of application

This part of ISO 7574 provides guidelines for determining the labelled-values of the noise emissions of individually-labelled machinery and equipment, that is, in the situation in which each machine produced has its own individually-labelled value of its noise emission quantity. It also specifies a method for verifying compliance of the noise emission of an individual machine or item of equipment with its labelled value.

This part of ISO 7574 does not deal with the consequences that ensue if the stated value is not confirmed as verified for a single machine.

2 References

ISO 3741, *Acoustics — Determination of sound power levels of noise sources — Precision methods for broad-band sources in reverberation rooms.*

ISO 3742, *Acoustics — Determination of sound power levels of noise sources — Precision methods for discrete-frequency and narrow-band sources in reverberation rooms*

ISO 3743, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for special reverberation test rooms.*

ISO 3744, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for free-field conditions over a reflecting plane.*

ISO 3745, *Acoustics — Determination of sound power levels of noise sources — Precision methods for anechoic and semi-anechoic rooms.*

ISO 3746, *Acoustics — Determination of sound power levels of noise sources — Survey method.*

ISO 4871, *Acoustics — Noise labelling of machinery and equipment.*

ISO 7574/1, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 1 : General considerations and definitions.*

ISO 7574/4, *Acoustics — Statistical methods for determining and verifying stated noise emission values of machinery and equipment — Part 4 : Methods for stated values for batches of machines.*

3 Definitions

For the purposes of this part of IS 7574, the definitions given in ISO 7574/1 apply.

4 General

When checking compliance of a machine with its individually-labelled value, this part of ISO 7574 works on the principle that the labelled value indicates the limit below which the noise emission value of the machine lies.

NOTE — In the application of this part of ISO 7574, it is assumed that all measurements will be performed by a testing laboratory which has appropriate test facilities and trained staff.

5 Guidelines for determination of the labelled value, L_c, by the labeller

As the determination of the labelled value is the sole responsibility of the labeller, this clause is given for guidance only.

The measured value (or the mean of several measured values) for the individual machine is designated L^* and shall be determined in accordance with the specific measurement test code for the specific family of machines. (The asterisk in the symbol is used here to differentiate between measurements in conformity with this clause and those in conformity with clause **6**).

NOTES

1 If such a specific measurement test code does not exist, the methods specified in ISO 3741, ISO 3742, ISO 3743, ISO 3744 and ISO 3745[1] may be used if the installation and operating conditions typical for normal use are clearly stated or agreed.

2 If the specific measurement test code for the family of machines provides more than one mode of operation in normal use, the mode yielding the highest value of L^* or the mode agreed upon in the relevant machinery industry or in the contract should be used to determine L_c. The installation and operating conditions and the measurement test code used be clearly stated.

The labelled value, L_c for the machine may be determined by

$$L_c \geqslant L^* + K$$

The value of K in the above equation shall be chosen to account for the random measurement errors occurring under reproducibility conditions (see **3.17** of ISO 7574/1). An appropriate value may be determined by multiplying the standard deviation of reproducibility, σ_R, by the quantile, u_{P_a}, for the desired probability of acceptance, P_a, from table 7 in ISO 7574/4. A value of $K = 3$ dB is appropriatein many cases ($u_{P_a} = 1{,}645$ for $P_a = 95\ \%$; $\sigma_R = 1{,}8$ dB) and is given for guidance.

NOTE — If the stated value is only relevant for one contract, for example, and is (according to this contract) to be verified in the testing laboratory test site of the labeller, K may be chosen by the labeller to account only for the variability of the measurement values under repeatability conditions (see **3.16** in ISO 7574/1). If it is to be verified in a different laboratory, the variability of measurement value under reproducibility conditions has to be taken into account when determining K. Experience gained to the past with similar machines and with different testing laboratories test sites will usually be helpful when determining K.

6 Verifying the labelled value for an individual machine

Compliance is checked with a measurement made in accordance with the specific measurement test code for the specific family of machines or, if no such code exists, in accordance with ISO 3741, ISO 3742, ISO 3743, ISO 3744 or ISO 3745 (see footnote to clause **5**), using the same installation and operating conditions as specified in clause **5**. The measured value L, obtained in accordance with the test code, and which shall not be rounded, is compared with the labelled value L_c.

The rules governing the decision shall be as follows:

If $L \leqslant L_c$, the labelled value is confirmed as verified for the single machine;

If $L > L_c$, the labelled value is not confirmed as verified for the single machine.

7 Information to be given

The specific measurement test code for the specific family of machines, or, if no such code exist, ISO 3741, ISO 3742, ISO 3743, ISO 3744 or ISO 3745, and the installation and operating conditions used shall be stated.

NOTE — For the purposes of this part of ISO 7574, it is not usually necessary to draw up a special noise labelling code for the specific family of machines (see ISO 4871 and ISO 7574/4).

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[1] This does not preclude the use of other International Standards, e.g. ISO 3746, which may form the basis of the special measurements test code.

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